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ABSTRACT

Remedial mathematics has taken several forms over the years--across the nation, within departments, and among mathematics instructors. There is a growing debate over the effectiveness of remedial courses in relationship to eventual student matriculation, which increases institution funding. The use of technology, real-life problems and projects, self-paced study, as well as early diagnoses are critical issues facing those involved in remediation at the community college. This paper focuses on technology, success rates of remediated students, and how to better prepare students for college-level mathematics courses. One key part of the effectiveness of technology in the classroom is student-teacher interaction. This human interaction must continue as the main form of formal instruction with technology acting as a conduit for this to take place efficiently. This report addresses the issue of finding better ways to get students coming out of developmental courses better prepared for college-level work. It states that the focus on rote memorization of formulas, algorithms, and rules is a hindrance to students at the developmental level as they impede progress towards higher-order thinking required in most college-level courses. The paper concludes with the statement that proper placement of students through the ministering of placement tests into appropriate courses, be they developmental or otherwise, is essential to student success. (VWC)

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# Reaction Paper on **Remediation in the Community College Mathematics Curriculum**

by Shawn Robinson
for Dr. Kubala
Fall, 1995

Remedial mathematics has taken several forms over the years, across the nation, within departments, and among mathematics instructors. There is a growing debate over the effectiveness of remedial courses in relationship to eventual student matriculation, which increases institution funding. The use of technology, real-life problems and projects, self-paced study, as well as early diagnoses are critical issues facing those involved in remediation at the community college. I shall focus on technology, success rates of remediated students, and how to better prepare students for college-level mathematics courses.

The National Council of Teachers of Mathematics (Hector) has listed some objectives of the community college mathematics curriculum to include: to help individuals solve problems of adult life; to prepare adults for jobs, vocations, or professions; and to impart that mathematics is a dynamic, developing element of human culture. In keeping with these objectives, remedial mathematics course curricula must "present mathematics as a developing human discipline and demonstrate it's connection to other disciplines" and "illustrate the power of mathematical thinking as a foundation for independent, lifelong learning" (Hector). I agree that mathematics must be integrated into other disciplines as much as possible without seeming "hokey." Conversely, mathematics must bring in other

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disciplines as often as appropriate so that students do not see mathematics and other courses in a vacuum. The proper utilization of technology in courses, even at the arithmetic level, can spark student interest and involvement. It is extremely helpful for students to get a grasp on the concepts in an efficient manner, as well as provide motivation for future learning. When students can see graphs and data in a neat package with very little effort, it will become easier for them to learn concepts and see patterns.

Technology and its role in the mathematics curriculum was addressed with caution by Johnson. He states that "Recognition of the fact that calculators (or computers) are no panacea is the beginning of wisdom in their appropriate use." One key part of the effectiveness of technology in the classroom is student-teacher interaction. This human interaction must continue as the main form of formal instruction with technology acting as a conduit for this to take place efficiently. For the most part, at Valencia, the faculty and students are willing to give the technology a try. If the attitudes are pleasant and eager, then the environment will be conducive to effective technology usage.

Diehl looked at the pass rates of disciplines at Prince George's Community College. The results could be interpreted as showing trouble in the developmental mathematics curriculum. Of the disciplines with at least 30 students enrolled, the highest failure rates went to developmental English (34%), Mathematics (39%), Anthropology (39%), and developmental Mathematics (42%). According to data from Valencia Community College, the mathematics area is consistently at or near the top of the failure rate list (40%). This is especially true in the developmental classes. Many of Valencia's

developmental courses are taught in a self-paced environment. This setting is not usually beneficial to the student with little self-motivation. The lack of structure provides many students with a reason for not succeeding. Many sections of developmental courses are taught by adjuncts who have little training, not much time for outside student-teacher consultations (due to lack of required office hours and office space), limited knowledge of available resources, and lack of respect from students and full-time faculty. Many of these instructors are "out of the loop" and need to be involved in departmental and curricular decisions.

Lyons, in his research, sought to correlate student performance in developmental mathematics courses with success in subsequent mathematics courses. The studies compared students who had taken prerequisite developmental courses to those who had been placed out of those same developmental courses. The data showed that among students entering developmental courses, there was no significant difference in pass rates (51% to 53%, respectively) between the two groups of students. There however was a major shift when comparing performance in subsequent non-developmental mathematics courses. The students from developmental courses passed at a 52% rate as compared to a rate of 63% for the non-developmentally placed students. This may seem as a blow to the developmental programs. Indeed one might wonder about ways to get the students coming out of developmental courses better prepared for college-level work. The focus on rote memorization of formulas, algorithms, and rules is a hinderance to students at the developmental level. I feel that too much focus of these types of activities impedes

progress towards higher-order thinking required in most college-level courses. "Garbage in, garbage out."

The proper placement of students into appropriate courses, be they developmental or otherwise, is essential to student success. My research indicates that there are some institutions that may not have required placement testing of in-coming students. At Redlands Community College, it took finding a new college president to change things (Jenkins). Many students would be in a college-level mathematics course for weeks before taking the placement test and having a recommendation to drop down a level or more. Few students thought that they should try the remedial class. It is important to not only look at test scores (CPT, ASSET, SAT, and ACT), but to take into account student performance in high school mathematics (if the student is a recent graduate). I feel that is important to give placement tests after the student understands how the score will affect his or her future coursework. Many students take the tests after spending hours in long lines and just want the test to end. Others are good at guessing, which miss places them. Guessing must be discouraged and timing is critical.

With appropriately placed students, faculty knowledgeable of student mathematics backgrounds and expectations, and the effective use of technology and applications, students and faculty will be successful in the remediation process.

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